Interaction Peaks and Data-Driven Interfaces for Online Lecture Videos

Understanding In-Video Dropouts and Interaction Peaks in Online Lecture Videos.

### Video interaction data from MOOCs

**Motivation:** How do students learn from videos on Massive Open Online Courses (MOOCs)? We analyze *video interaction data* (pause, play, scrubbing).

**Dataset:** interaction log from 4 edX courses in Fall 2012

<table>
<thead>
<tr>
<th>Course</th>
<th>Subject</th>
<th>University</th>
<th>Students</th>
<th>Videos</th>
<th>Video Length</th>
<th>Processed Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.00x</td>
<td>Intro CS &amp; Programming</td>
<td>MIT</td>
<td>59,126</td>
<td>141</td>
<td>7.40</td>
<td>4,091,568</td>
</tr>
<tr>
<td>18.06x</td>
<td>Statistics for Public Health</td>
<td>Harvard</td>
<td>30,742</td>
<td>301</td>
<td>10.48</td>
<td>15,832,069</td>
</tr>
<tr>
<td>CS188.1x</td>
<td>Artificial Intelligence</td>
<td>Berkeley</td>
<td>22,690</td>
<td>140</td>
<td>4.45</td>
<td>14,374,203</td>
</tr>
<tr>
<td>1.09x</td>
<td>Solid State Chemistry</td>
<td>MIT</td>
<td>15,281</td>
<td>271</td>
<td>6.19</td>
<td>4,821,837</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>127,839</td>
<td>862</td>
<td>7.46</td>
<td>39,319,787</td>
</tr>
</tbody>
</table>

### Video dropout analysis

**Video dropout:** percentage of students navigating away from a video before completion

**Overall dropout rate:** 55.2% (36.6% within the first 3%)

Longer videos have a higher dropout rate. Re-watching sessions have a higher dropout rate.

### Interaction peak analysis

**Interaction peaks** occur when a significant number of students play, pause, or replay at the time of the video.

- 3.7 peaks per video on average
- **Tutorial videos** show more frequent and stronger peaks than **lecture videos**.
- **Re-watching sessions** show more frequent and stronger peaks than **first-time sessions**.

### What causes interaction peaks to occur?

**Observation:** interaction peaks often accompany visual transitions in the video.

### Implications

**For video editors & instructors**
- Avoid sudden visual transitions
- Make shorter videos

**For video interfaces**
- Provide interactive links and screenshots for highlights.
- Consider video summarization for selective watchers.
- Enable one-click access for steps in tutorial videos.

### Data-driven video interface

Can video interaction data be used to improve students’ learning experience?

**Video interface dynamically generated by learner data**

Interactive links and screenshots for highlights. Video summarization for selective watchers. One-click access for steps in tutorial videos.

### Acknowledgements

- This work is supported in part by *Quanta Computer & edX*.
- Juho Kim is supported by the *Samsung Fellowship*.